

REMARKS

I. Status of the Application

Claims 1 - 84 are pending. Claims 1-3, 5, 14-16, and 19 are amended. Claims 32-64 are cancelled without prejudice. Claims 65 - 86 are new.

II. Amendments

Independent claim 1 has been amended to recite that: the first coil is wound about a second longitudinal axis along the same direction as the first longitudinal axis; the longitudinal axis of the longitudinal member is a “third” axis along a second direction transverse to the first axis “during operation;” and the second coil is wound about a fourth longitudinal axis transverse to the first direction. The orientations of the claimed components are shown in Fig. 11, for example. In addition, the phrase “for containing” has been amended to “to contain.”

Claim 2 has been amended to recite a “test” fixture, as in claim 1, upon which it depends. Claim 3 has been amended to be dependent on claim 1 and to recite a “test” fixture. Claim 5 has been amended to be consistent with the amendments to claim 1. Claims 14 and 15 have been amended to broaden the language. Claim 15 has also been amended to be consistent with the amendments to claim 1.

Independent claim 16 has been amended to recite in the last paragraph that the longitudinal member supporting the second coil is the “third” longitudinal member. The scope of the claim has not been changed.

Independent claim 19 has been amended to require that the body portion has a longitudinal axis and first and second ends aligned with the axis. At least one of the first and second ends is adapted to be connected to an MRI system. In Fig. 3, for example, one end of the test fixture has openings 136 for receiving bolts to connect the test fixture to one pole of the MRI

system. The other end has slots 138 to receive electrical leads in the other pole. Fig. 11 shows the test fixture connected to opposing poles in an MRI system.

III. Specification

The Examiner has alleged that the title of the invention is not descriptive. It is respectfully submitted that the title, “MRI Test Fixture,” is precisely descriptive of the invention. The preamble of claim 1 recites, for example, “Claim 1. A test fixture for use in a magnetic resonance imaging system” (emphasis added). If the Examiner has a suggestion for an even more descriptive title, it will be considered.

IV. Drawings

The Examiner requires that Fig. 1 be designated “Prior Art.” Fig. 1 has been so amended.

V. Claim Rejections

Claims 1-3, 6, 7, 9-14, 19-23, and 25-29 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,432,449A1 (“Ferut”).

A. Independent Claim 1

Independent claim 1 has been amended to recite that the first coil is wound about a second longitudinal axis along a first direction and that the second coil is wound around a fourth longitudinal axis along a direction transverse to the first direction.

In Ferut, in contrast, all the coils 68, and 52a-52c are wound around parallel axes that are all along the same direction. The only variations in the positions of the coils that Ferut provides is to the height of the coils above the body portion. Ferut varies the height of the coils by use of a spacer and varies the location of a coil with respect to the body portion by positioning the coil or the coil and spacers in the different apertures in the body portion. Since the axes through each coil are along the same direction, the coils have the same orientation in space, even though they

may be at different locations within an imaging volume of an MRI system. All the coils in Ferut measure the MRI signal emitted by test substances, at the different heights and locations with respect to the body portion.

Since Ferut does not show first and second coils wound around axes along different directions, claim 1 and the claims dependent upon it are not anticipated by Ferut.

Providing test coils along different directions, as in claim 1, enables the test fixture of claim 1 to measure different characteristics within the imaging volume. For example, one coil may detect the gradient fields and the other may monitor the magnetic field of the magnet by detecting the Larmor frequency of a test substance in the container. (See page 13, lines 12-14; and page 28, line 21; page 29, line 6, for example). Neither Ferut nor the other cited references teach or suggest providing first and second coils along transverse directions, as claimed, to enable testing of different characteristics or for any other reasons. Claim 1 and the claims dependent upon it are not, therefore, obvious in light of the cited references, either.

Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

B. Claim 19

Independent claim 19 has been amended to require that the body portion has a longitudinal axis and first and second ends aligned with the axis. At least one of the first and second ends is adapted to be connected to an MRI system. In Fig. 3, for example, one end of the test fixture has openings 136 for receiving bolts to connect the test fixture to one pole of the MRI system. The other end has slots 138 to receive electrical leads in the other pole.

In Ferut, in contrast, the test fixture 50 sits on a table cradle 18 within the interior volume 14 of the MRI system 10, as shown in Fig. 4 and described in column 4, lines 48-52. The mounting plate 54, which the Examiner considers to be a body portion, is clamped to the table

cradle 18. (Id.) The mounting plate does not have first and second ends aligned with a longitudinal axis, at least one of which is adapted to be connected to the MRI system, as claimed. The coils in Ferut are connected to a transmit/receive switch 38 (instead of the RF coil used in imaging) (Col. 3, line 67 - Col. 4, line 1). The coil connections are not at an end of the test fixture, aligned with a longitudinal axis of the fixture, either.

Claim 19 and the claims dependent upon it are not, therefore, anticipated by Ferut. In addition, neither Ferut nor the other references cited teach or suggest the claimed configuration. Claim 19 and the claims dependent upon it are not, therefore, obvious in light of the actual references.

Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

C. Claim 28

Claim 28 has also been rejected for allegedly being anticipated by Ferut, apparently for the same reasons as claim 26.

Claim 28 defines a test fixture comprising a body portion supporting a coil and comprising first and second members. The second member defines an opening for slidably receiving at least a portion of the first member. The first and second members may be moved with respect to each other to adjust the length of the body portion. (emphasis added).

In Ferut: “The test coil 52 can be positioned in any one of the apertures 56 Alternatively, a spacer module 58 can be placed on top of a first test coil 52a and a second test coil 52b is then placed on top of the spacer module as shown in Fig. 4.” (Col. 4, line 63 - Col. 5, line 1). The locator disk 60 is therefore positioned within the aperture 56 and the base 88 is connected to the locator disk. A spacer 58a, which is similar to element 85, may also be placed

within the aperture 56 (Col. 5, lines 2-5), and a test coil and other spacer modules placed above it. The locator disk and housing 85, or spacer 56, is locked into place within the aperture 56.

While the position of the coil or coils is adjusted by the use of spacers 56, a spacer 56 is either inserted into an aperture, or it is not. If no spacer is used, a coil has a first height. If one spacer is inserted into an aperture, a coil may be placed at a second height. If a second spacer is attached to the first spacer, a coil may be placed at a third height, etc. The first spacer has a definite position within the aperture and the aperture has a limited depth (see Fig. 1). It is the insertion of the first spacer completely into the aperture, the only possible position, which adjusts the height. Movement of the spacer module 56 within the aperture 56 does not adjust the length of the fixture, as claimed. The spacer or locator disk and housing 85 may not, therefore, be “moved with respect to” the aperture of the body position 50 to adjust a length of a body portion, as claimed.

Claim 26 and the claims dependent upon it are not, therefore, anticipated by Ferut. There is no teaching or suggestion to adjust the length of the body portion by moving one member with respect to another member in Ferut or the other cited references, as claimed. Claim 28 and the claims dependent upon it are not obvious in light of the cited references, either

Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

VI. Claim Rejections -- 35 U.S.C. § 103

Claims 4-5, 8, 15-18, 24 and 30-31 have been rejected under 35 U.S.C. § 103, as allegedly being unpatentable over Ferut in view of U.S. Patent No. 6,512,373B1 (“Griffin”).

Dependent claims 4-5, 8, 24 and 30-31 are allowable for being dependent on allowable independent claims 1, 19 and 28, as discussed above.

Independent claim 16 defines a test fixture comprising, in part, a third longitudinal member pivotally connected to the body portion. A second coil is supported by the third longitudinal member. In one example, the pivotable connection facilitates compact storage of the test fixture when not in use. It also facilitates positioning of a second coil in a different orientation than the first coil, when in use, as recited in new claim 82, which is dependent on claim 16.

The Examiner acknowledges that Ferut does not disclose such a pivotable connection, but asserts that Griffin shows such a pivotable connection and teaches “imaging a sample at a desired position with respect to the field”

Griffin describes a hand-operated device for an operator to control the spatial orientation of an image in a magnetic resonance tomography (“MRT”) system. Fig. 3 shows an operating station 16 of an MRT system where a plate 14 is pivotally connected to a first telescoping rod 3 and the rod is pivotally connected to a stand 17. The plate 14 is manipulated by an operator’s hand to cause a change in the spatial orientation of a resulting image, which is shown on the display 13. (Col. 7, line 43 - Col. 8, line 2). The spatial orientation is typically changed by changing the gradient magnetic fields of the system in response to movement of the device. The device is positioned outside of the MRT system.

Griffin’s hand-operated device is not a test fixture, as claimed. No coils are supported by Griffin’s hand-operated device, as claimed. Griffin’s device is not used in an imaging volume of an MRI system. Griffin’s device is a completely different device for a completely different purpose than the claimed test fixture. There is no teaching or suggestion in Griffin to support test coils by such a hand-operated device or to position a test coil via a pivotable connection, as claimed. There is no such suggestion in Ferut, either. Ferut only discusses varying the height

and location of one or more coils with spacers. The Examiner has not identified a teaching of where or how a pivotable connection could be provided on the Ferut system, either. None of the other cited reference provide a relevant teaching, either.

Claim 16 and the claims dependent upon it are not, therefore, obvious in light of Ferut, Griffin and any of the other cited references.

Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

VII. The New Claims

New 65-67, 84, and 85, which are directly or indirectly dependent on independent claims discussed above, add additional features supported by the original claims, the specification, and/or the figures.

New independent claim 68 defines a test fixture comprising a base with an axis and two coils, each with a different orientation with respect to the axis of the base. In Ferut, the coils are wound around parallel axes. They therefore have the same orientation with respect to any axis of the base in Ferut. New claims 69-78, and 86, which are directly or indirectly dependent on claim 68, add additional features.

New independent claim 79 defines a test fixture comprising a base portion comprising first and second telescoping members and a member pivotally connected to the base portion. The first and second coils are supported by the base portion and the member, respectively. The telescoping members are movable with respect to each other, to extend the length of the body portion from a first length to a second length. As discussed above, none of the cited references show a test fixture with a telescoping portion and a pivotable connection, as claimed.

New claim 80, which is dependent on claim 79, recites that the first and second coils are wound around first and second axes, respectively. The longitudinal member is rotatable from a

first position to the second position to position the axis of the second coil in a direction transverse to a direction of the first axis. None of the cited references show or suggest providing coils wound around axes, wherein the axes are along different directions, as claimed. New claim 81, which is independent in claim 80, adds a container to support a test substance adjacent to the second coil. New claim 82 recites that the container is within a region defined by the second coil. New claim 83, which is also dependent on claim 79, recites that in the first position of the longitudinal member, a longitudinal axis of the member is positioned along the first direction, as shown in Figs. 4 and 6, for example. This enables compact storage when not in use. None of the cited references show such a feature, either.

No new matter has been added. Entry and allowance of the new claims are respectfully requested.

VIII. Conclusion

Allowance of the application in light of these Amendments and Remarks are respectfully requested.

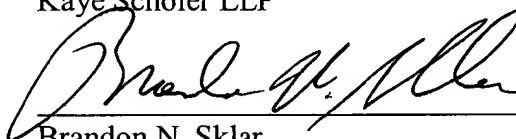
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